

POLYMER MODIFIED PORTLAND CEMENT MORTAR

Effective: June 7, 1994

Revised: January 1, 2002

Description. This work shall consist of furnishing all materials and labor required to remove and dispose of deteriorated concrete, and replace it with a polymer modified portland cement mortar at those locations shown on the plans or designated by the Engineer. The use of this mortar is intended to repair spalls between 10 mm (3/8 in.) and 50 mm (2 in.) deep on horizontal, vertical, and overhead surfaces.

Materials. Materials shall meet the following requirements:

- (a) Water shall be according to Section 1002.
- (b) Polymer modified portland cement mortar shall be a packaged product consisting of portland cement, fine aggregate, and a polymer.
 - (1) The portland cement shall be according to Article 1001.01
 - (2) The fine aggregate shall be an FA 1 or FA 2, according to Articles 1003.01 and 1003.02.
 - (3) The polymer modified portland cement mortar shall meet the following physical requirements:
 - a. The mortar shall be capable of bonding and holding its own plastic weight, when mixed and placed according to manufacturer instructions, on vertical and overhead surfaces.
 - b. The mortar shall have a minimum compressive strength of 10,300 kPa (1,500 psi) at 24 hours, 20,700 kPa (3,000 psi) at 3 days, and 34,500 kPa (5,000 psi) at 28 days; according to Illinois Modified AASHTO T 106.
 - c. The mortar shall have a minimum bond strength of 13,800 kPa (2,000 psi) at 28 days, according to Illinois Modified ASTM C 882.

The Department will maintain an Approved List of Polymer Modified Portland Cement Mortar.

Equipment. Equipment shall meet the following requirements:

- (a) Chipping hammers shall be pneumatic or electric, with a 6.8 kg (15 lb) class or less.
- (b) High-pressure waterblasting equipment shall have a minimum pressure of 48.2 MPa (7,000 psi).

Preparation. Remove all deteriorated concrete, dirt, oil, grease, and all bond-inhibiting materials. Preparation work shall be done with chipping hammers, high-pressure waterblasting equipment, or other equipment approved by the Engineer.

Repair configurations shall be kept simple, and shall have squared corners. The repair perimeter area shall be sawcut a minimum depth of 10 mm (3/8 in.). The repair depth shall be a minimum 10 mm (3/8 in.). An individual repair depth should not exceed 50 mm (2 in.). The substrate profile shall be ± 1.5 mm ($\pm 1/16$ in.).

Existing reinforcement bars shall be cleaned by sandblasting. After cleaning, all exposed reinforcement shall be carefully evaluated to determine if replacement or additional reinforcement bars are required.

The reinforcement bar shall be undercut a minimum 19 mm (3/4 in.) if the bond is broken between the reinforcement bars and the concrete during preparation, or if the bars have to be replaced or supplemented as specified below.

Reinforcing bars that have been cut or have lost 25 percent or more of their original cross sectional area shall be supplemented by new in kind reinforcement bars. New bars shall be lapped a minimum of 32 bar diameters to existing bars. An approved "squeeze type" mechanical bar splice capable of developing in tension at least 125 percent of the yield strength of the existing bar shall be used when it is not feasible to provide the minimum bar lap. No welding of bars will be permitted. The furnishing and replacing of supplemental reinforcement bars shall be included in this item.

Final Preparation. The repair area shall be sandblasted, and then vacuumed or blown clean. Blowing shall be done with oil-free compressed air. The repair area and perimeter sawcut shall have a rough surface after final preparation.

Placement. Prior to placement, saturate the repair area with water. Mix and place the polymer modified portland cement mortar according to the manufacturer's instructions. During placement, the substrate shall be in a saturated surface-dry condition. Any standing water shall be removed.

The mortar shall be placed and finished to the contours of the member, as originally constructed.

The mortar shall be placed when the air temperature is a minimum 7° C (45° F) and rising. The mortar shall not be placed when the air temperature exceeds 32° C (90° F).

Curing. Curing shall be for a minimum of 2 days, and shall be according to Article 1020.13(a)(3).

If temperatures below 7° C (45° F) are forecast during the curing period, protection methods shall be used. Protection Method I according to Article 1020.13(e)(1), or Protection Method II according to Article 1020.13(e)(2) shall be used during the curing period.

Method of Payment. Polymer modified portland cement mortar shall be measured for payment in place, and the area computed in square meters (square feet).

Basis of Payment. This work will be paid for at the contract unit price, per square meter (square foot) for POLYMER MODIFIED PORTLAND CEMENT MORTAR.